

WHAT IS CLAIMED IS:

1. A misalignment detector in an image forming apparatus in which a latent image is formed on a photosensitive drum by using a plurality of laser beams, while achieving an independent image, the
5 misalignment detector detects a position-shift of each laser beam based on an image formed on an image sensor of a position detection pattern that is formed on an image carrier, comprising:
 - a light source that outputs light;
 - a synthesizing unit that passes the light of the light source so as
10 to illuminate the position detection pattern, and collects and reflects a light reflected from the position detection pattern; and
 - a focusing unit that that focuses the light reflected from the synthesizing unit on the image sensor.
- 15 2. The misalignment detector according to claim 1, wherein the light synthesizing unit includes a prism.
3. The misalignment detector according to claim 1, wherein the position detection pattern includes a plurality of lines that are parallel to
20 each other.
4. The misalignment detector according to claim 1, wherein the position detection pattern includes dots of a predetermined size.

5. The misalignment detector according to claim 1, wherein the image sensor and the light source are mounted on a same circuit board.
6. The misalignment detector according to claim 3, comprising:
5 an adding unit that adds up image data of a two-dimensional image sensor in any one of the main scanning direction and the secondary scanning direction; and
a peak-position detector that detects a peak position in one-dimensional data that is output by the adding unit.
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7. The misalignment detector according to claim 4, comprising:
an adding unit that adds up image data of a two-dimensional image sensor in any one of the main scanning direction and the secondary scanning direction; and
15 a peak-position detector that detects a peak position in one-dimensional data that is output by the adding unit.
8. A misalignment detector, in an image forming apparatus, that detects misalignment of laser beams that form latent images on a
20 photosensitive drum based on detection of a position detection pattern on an image carrier, comprising:
a light source, a synthesizing unit, a focusing unit, an image sensor, and a misalignment calculator that detects the misalignment of the laser beams based on an image formed in the image sensor,
25 wherein the light source, the synthesizing unit, the focusing unit, and

the image sensor are arranged in such a manner that,
light illuminated by the light source passes through the
synthesizing unit so as to illuminate the position detection pattern, gets
reflected from the position detection pattern, passes through the
5 synthesizing unit so as to be focused by the focusing unit on the image
sensor.

9. An image forming apparatus comprising:
a photosensitive drum to form a latent image by each of a
10 plurality of laser beams;
an image carrier with a position detection pattern; and
a misalignment detector that detects misalignment of the laser
beams, the misalignment detector including a light source, a
synthesizing unit, a focusing unit, an image sensor, and a misalignment
15 calculator that detects the misalignment of the laser beams based on an
image formed in the image sensor, wherein the light source, the
synthesizing unit, the focusing unit, and the image sensor are arranged
in such a manner that light illuminated by the light source passes
through the synthesizing unit so as to illuminate the position detection
20 pattern, gets reflected from the position detection pattern, passes
through the synthesizing unit so as to be focused by the focusing unit
on the image sensor.